

May 11, 2015

Rev. 1



May 20, 2015

Ms. Laine Sumner  
CH2M HILL Plateau Remediation Company  
2420 Stevens Center  
Richland, WA 99352

Re: ALS Workorder: 1503381  
Project Name: 100-KR-4 Pump and Treat Influent & Effluent Tanks - Water  
Project Number: F11-002

Dear Mr. Evans:

Three water samples were received from CH2M HILL Plateau Remediation Company, on 3/19/2015. The samples were scheduled for the following analyses:

Metals

The results for these analyses are contained in the enclosed reports.

This report was originally submitted on 3/31/2015. It is being re-submitted with new forms that list the correct method and correct MDL.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Julie Ellingson  
Project Manager

ADDRESS 225 Commerce Drive, Fort Collins, Colorado, USA 80524 | PHONE +1 970 490 1511 | FAX +1 970 490 1522

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Environmental

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1 of 16

## Problem and Discrepancy Report

ALS

SDG ALS1503381

05/05/15

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**The data package has the following issues:**

ALS1503381 lists the method to measure chromium on this environmental sample as NIOSH7300.

The MDL/DL for chromium is reported as 7.4 ug/L

**Resolution:** *Provide correction.*

**Lab Response:** A revised report that lists the correct method and correct MDL is submitted.  
The EDD was submitted with the correct information.

Please correct the issues and re-submit the hard copy and electronic data package.

ALS is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Laboratory Certifications	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Maryland (MD)	285
Missouri	175
Nebraska	NE-OS-24-13
Nevada (NV)	CO000782008A
New Jersey (NJ)	CO003
North Dakota (ND)	R-057
Oklahoma	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington	C1280

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 1503381

**Client Name:** CH2M HILL Plateau Remediation Company

**Client Project Name:** 100-KR-4 Pump and Treat Influent & Effluent Tanks - Water

**Client Project Number:** F11-002

**Client PO Number:** BOA 54854

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B30C74	1503381-1		WATER	17-Mar-15	12:48
B30C72	1503381-2		WATER	17-Mar-15	12:15
B30C70	1503381-3		WATER	17-Mar-15	12:42

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F11-002-101	PAGE 1 OF 1
COLLECTOR	S.W. King CHPRC	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE	7H	DATA
SAMPLING LOCATION		PROJECT DESIGNATION			AIR QUALITY	<input type="checkbox"/>	TURNAROUND 30 Days / 30 Days
ICE CHEST NO.	100-KR-4, EFF VAL T-K5 (FILTER VENT)-001	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO	ALS Environmental Ft. Collins	OFFSITE PROPERTY NO.		BILL OF LADING / AIR BILL NO.			
POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		PRESERVATION	HN03 to pH <2	1503381			
		HOLDING TIME	6 Months				
		TYPE OF CONTAINER	G/P				
		NO. OF CONTAINER(S)	1				
		VOLUME	500mL				
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS	6020_METALS_ICPMS: COMMON (Chromium);				
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C74	WATER	MAR 17 2015	1248				

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TRVL-15-018	
S.W. King	MAR 17 2015 1415	SSU-1	MAR 17 2015 1-115		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
SSU-1	MAR 18 2015 0815	CHRIS FULTON	MAR 18 2015 0815		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
CHRIS FULTON	MAR 18 2015 1400	FEDEx			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
FEDEx		C Trimble	3-23-15 0900		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	SCGL		3-19-15	0950
		DISPOSED BY		DATE/TIME	

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PRINTED ON 3/17/2015

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CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F11-002-097	PAGE 1 OF 1				
COLLECTOR	S.W. King CHPRC	COMPANY CONTACT	SUMNER, LC	TELEPHONE NO.	376-3922	PROJECT COORDINATOR	SUMNER, LC	PRICE CODE	7H	DATA	TURNAROUND
SAMPLING LOCATION		PROJECT DESIGNATION	100-KR-4 Pump and Treat Influent & Effluent Tanks - Water		SAF NO.	F11-002	AIR QUALITY	<input type="checkbox"/>	30 Days / 30 Days		
ICE CHEST NO.		FIELD LOGBOOK NO.	HVF-N 506-69		ACTUAL SAMPLE DEPTH	N/A	COA	302891	METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO		OFFSITE PROPERTY NO.	5490		BILL OF LADING/AIR BILL NO. 773154699514						
ALS Environmental Ft. Collins		PRESERVATION		HNO3 to pH <2		3/19/15					
MATRIX* A=Air DL=Drum L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other		HOLDING TIME		6 Months		15D3381					
		TYPE OF CONTAINER		G/P							
		NO. OF CONTAINER(S)		1							
		VOLUME		500ml							
		SAMPLE ANALYSIS		6020 METALS, ICPMS: COMMON (Chromium);							
SPECIAL HANDLING AND/OR STORAGE		SAMPLE DATE		SAMPLE TIME		MAR 17 2015 1242					
SAMPLE NO.		MATRIX*		WATER							
B30C70											

[illegible]



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: CHPRCWorkorder No: 1503381Project Manager: JEInitials: CDT Date: 3-19-15

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES	NO
3. Are Custody seals on sample containers intact?	NONE	<input checked="" type="radio"/> YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<input checked="" type="radio"/> YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	<input checked="" type="radio"/> N/A	YES	NO
15. Do any water samples contain sediment? Amount of sediment: ____ dusting ____ moderate ____ heavy	Amount N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		YES	<input checked="" type="radio"/> NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	RAD ONLY	YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>			
Temperature (°C): <u>Amb</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>11</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)			

**Additional Information:** PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / ☒ NA Contact: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Project Manager Signature / Date: [Signature] 3/23/15



May 11, 2015

Page 1 of 2

From: (509) 373-3547  
Chris Fulton  
CH2M  
6287 Iatah st  
richland, WA 99354

Origin ID: PSCA

FedEx  
Express



J1512150223030W

SHIP TO: (970) 498-1511  
Julie Ellingson

BILL THIRD PARTY

225 Commerce Drive  
FORT COLLINS, CO 80524

Ship Date: 18MAR  
ActWgt: 21.0 LB  
CAD: 107086051/NET3810

Amb

1503381

Delivery Address Bar Code



Ref # ph#5490  
Invoice #  
PO #  
Dept #

THU - 19 MAR 10:30A  
PRIORITY OVERNIGHT

TRK# 7731 5489 9514  
8281

DSR  
80524  
CO-US  
DEN

XH FTCA



537J1879MEE4B

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## Metals

### Case Narrative

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#### **CH2M HILL Plateau Remediation Company**

100-KR-4 Pump and Treat Influent & Effluent Tanks - Water -- F11-002

Work Order Number: 1503381

1. This report consists of 3 water samples.
2. The samples were received intact at ambient temperature by ALS on 03/19/15.
3. The samples had a pH less than 2 upon receipt.
4. The samples were prepared and analyzed based on SW-846, 3<sup>rd</sup> Edition procedures.

For analysis by ICP-MS, the samples were digested following method 3005A and the current revision of SOP 806.

5. Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold time.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch.
  - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analyte. Sample results have been compared to the blank results.
  - All laboratory control sample criteria were met.



- All initial and continuing calibration blanks were below the reporting limit for the requested analyte.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analyte.
- The interference check samples associated with Method 6020A were analyzed.

9. Matrix specific quality control procedures.

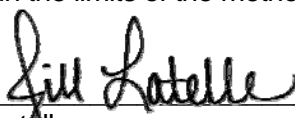
Sample 1503381-1 was designated as the quality control sample for this analysis.

Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- A sample duplicate and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this ICP batch. All acceptance criteria were met.

10. It is a standard practice that samples for ICP-MS are analyzed at a dilution. The 10X factor can be considered an artifact of the prep and does not indicate a secondary dilution and is therefore not flagged as a dilution.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

  
\_\_\_\_\_  
Jill Latelle  
Inorganics Primary Data Reviewer

3/30/15  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Julie Ellinger  
Inorganics Final Data Reviewer

3/30/15  
\_\_\_\_\_  
Date



### **Inorganic Data Reporting Qualifiers**

The following qualifiers are used as needed by the laboratory when reporting results of inorganic analyses.

- Result qualifier -- A “B” is entered if the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL). If the analyte was analyzed for but not detected a “U” is entered. For samples, negative values are reported as non-detects (“U” flagged). For blanks, if the absolute value of the negative value is above the MDL and below the reporting limit, then the result is “B” flagged.
- QC qualifier -- Specified entries and their meanings are as follows:
  - E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
  - M - Duplicate injection precision was not met.
  - N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
  - Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
  - \* - Duplicate analysis (relative percent difference) not within control limits.
  - S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.
  - C - The analyte was detected in both the sample and the associated QC blank, and the sample concentration was  $\leq 5X$  the blank concentration.
  - D - Analyte was reported at a secondary dilution factor, typically  $DF > 1$  (i.e., the primary preparation required dilution to either bring the analyte within the calibration range or to minimize interference). Required for organics/wetchem if the sample was diluted.

**Total Recoverable CHROMIUM****Method SW6020A****Sample Results****Lab Name:** ALS Environmental -- FC**Client Name:** CH2M HILL Plateau Remediation Company**Client Project ID:** 100-KR-4 Pump and Treat Influent & Effluent Tanks - Water F11-002**Work Order Number:** 1503381**Final Volume:** 50 ml**Reporting Basis:** As Received**Matrix:** WATER**Analyst:** Brent A. Stanfield**Result Units:** UG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Flag	Sample Aliquot
B30C74	1503381-1	3/17/2015	3/25/2015	03/26/2015	N/A	10	0.91	10	0.74	B	50 ml
B30C72	1503381-2	3/17/2015	3/25/2015	03/26/2015	N/A	10	0.74	10	0.74	U	50 ml
B30C70	1503381-3	3/17/2015	3/25/2015	03/26/2015	N/A	10	5.7	10	0.74	B	50 ml

**Comments:**

1. ND or U = Not Detected at or above the client requested detection limit.

**Data Package ID:** *IM1503381-1*

## ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1503381

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 100-KR-4 Pump and Treat Influent &amp; Effluent Tanks - Water F11

Lab ID: IP150325-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 25-Mar-15

Date Analyzed: 26-Mar-15

Prep Batch: IP150325-4

QCBatchID: IP150325-4-1

Run ID: im150326-10a2

Cleanup: NONE

Basis: N/A

File Name: 080SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	0.74	10	0.74	U	

Data Package ID: IM1503381-1

# ICPMS Metals

## Method SW6020A

### Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1503381

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 100-KR-4 Pump and Treat Influent &amp; Effluent Tanks - Water F11

Lab ID: IP150325-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 03/25/2015

Date Analyzed: 03/26/2015

Prep Method: SW3005A

Prep Batch: IP150325-4

QCBatchID: IP150325-4-1

Run ID: im150326-10a2

Cleanup: NONE

Basis: N/A

File Name: 081SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-47-3	CHROMIUM	500	484	10		97	80 - 120%

Data Package ID: IM1503381-1

## ICPMS Metals

Method SW6020A

## Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1503381

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 100-KR-4 Pump and Treat Influent &amp; Effluent Tanks - Water

Field ID: B30C74

LabID: 1503381-1MS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 17-Mar-15

Date Extracted: 25-Mar-15

Date Analyzed: 26-Mar-15

Prep Method: SW3005 Rev A

Prep Batch: IP150325-4

QCBatchID: IP150325-4-1

Run ID: im150326-10a2

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 085SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	0.91	B	476		10	500	95	75 - 125%

Field ID: B30C74

LabID: 1503381-1MSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 17-Mar-15

Date Extracted: 25-Mar-15

Date Analyzed: 26-Mar-15

Prep Method: SW3005 Rev A

Prep Batch: IP150325-4

QCBatchID: IP150325-4-1

Run ID: im150326-10a2

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 086SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	475		500	95	10	20	0

Data Package ID: IM1503381-1